

Roll.No.

20UPHCT4008

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.

B.Sc.Physics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - IV

20UPHCT4008 -Electricity and Magnetism

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

Section B

Answer any **SIX** questions ($6 \times 5 = 30$ Marks)

1. State Gauss's law and write its mathematical form.
2. Write the expression for the electric field intensity due to a uniformly charged conducting sphere.
3. State the principle of a potentiometer.
4. How is the internal resistance of a cell determined using a potentiometer?
5. Write the expression for the growth of current in an RL circuit.
6. Write the expression for the decay of charge in an RC circuit.
7. State Seebeck and Peltier effects.
8. What is hysteresis? Mention its importance.

Section C

Answer any **THREE** questions ($3 \times 10 = 30$ Marks)

9. Derive the expression for the electric field due to a uniformly charged non-conducting sphere at a point
 - (i) inside and
 - (ii) outside the sphere.
10. Explain the principle of Carey Foster's bridge and describe how it is used to determine the resistance of a given wire.
11. Derive the expression for charging of a capacitor through a resistor (RC circuit).
12. Explain the construction and working of a thermoelectric refrigerator.
13. Explain Langevin's theory of paramagnetism and derive an expression for magnetic susceptibility.
